

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A ball given quantity supply apparatus, comprising:

a ball storage portion for storing a plurality of balls therein;

a ball arranging device for arranging a plurality of balls stored in the ball storage portion in a line;

a ball delivery device including a ball passage extended from the ball storage portion so as not only to be able to receive a plurality of balls arranged in a line by the ball arranging device when the plurality of balls are supplied thereto but also to allow the plurality of balls supplied thereto to pass in a line therethrough, the ball delivery device being capable of delivering the plurality of balls arranged in a line in the ball passage from the ball storage portion to the extended end portion of the ball passage using gravity;

a first gate device disposed at a position near to the ball storage portion in the ball passage of the ball delivery device for opening and closing the ball passage;

a second gate device disposed at a position more distant from the ball storage portion in the ball passage of the ball delivery device than the first gate device for opening and closing the ball passage and also for holding a given quantity of balls between the first gate device and itself;

a pressurized fluid jetting device disposed in the vicinity of the first gate device in the ball passage of the ball delivery device for jetting out a pressurized fluid onto the balls to thereby separate substances attached to the surfaces of the balls from these surfaces; and

an operation control device for detecting that a given quantity of balls are held between the first and second gate devices in the ball passage of the ball delivery device, and also for controlling the operations of the first and second gate device, wherein

the operation control device opens the first gate device and closes the second gate device while the plurality of balls arranged in a line by the ball arranging device are being supplied into the ball passage of the ball delivery device, and closes the first gate device and

opens the second gate device after it is detected that a given quantity of balls are held between the first and second gate ~~device~~ devices in the ball passage of the ball delivery device.

2. (Original) The ball given quantity supply apparatus as set forth in Claim 1, wherein
the ball storage portion includes a ball receiving recessed portion for receiving a plurality of balls therein;

the ball receiving recessed portion has a structure in which the plurality of balls in the ball receiving recessed portion are arranged along a given area of the inner peripheral surface thereof due to gravity;

the ball arranging device arranges the plurality of balls along the given area of the inner peripheral surface of the ball receiving recessed portion of the ball storage portion in a line; and

the ball passage of the ball delivery device is open in the ball receiving recessed portion of the ball storage portion along the given area of the inner peripheral surface of the ball receiving recessed portion of the ball storage portion, and is supplied with the plurality of balls arranged in a line by the ball arranging device through the opening thereof.

3. (Original) The ball given quantity supply apparatus as set forth in Claim 1, wherein
the cross section of the ball passage has a polygonal shape.

4. (Original) The ball given quantity supply apparatus as set forth in Claim 3, wherein
the pressurized fluid jetting device jets out the pressurized fluid into between the outer peripheral surfaces of the balls passing through the ball passage and at least one of a plurality of corners of the polygonal shape of the cross section in the cross section of the ball passage.

5. (Original) The ball given quantity supply apparatus as set forth in Claim 1, further comprising:

a pressurized fluid discharge device disposed in the vicinity of the first gate device and at a position nearer to the extended end portion than the second gate device in the ball passage of the ball delivery device for discharging the pressurized fluid jetted from the pressurized fluid jetting device into the ball passage to the outside of the ball passage.

6. (Original) The ball given quantity supply apparatus as set forth in Claim 1, wherein the pressurized fluid jetting device jets out the pressurized fluid intermittently.

7. (Original) The ball given quantity supply apparatus as set forth in Claim 1, wherein the operation control device includes:

a first ball detector disposed in the ball passage of the ball delivery device so as to adjoin the downstream side of the first gate device, and

a second ball detector disposed in the ball passage of the ball delivery device so as to adjoin the upstream side of the second gate device.

8. (Original) The ball given quantity supply apparatus as set forth in Claim 1, wherein the ball arranging device includes:

a ball forced supply device for supplying forcibly the plurality of balls arranged in a line by the ball arranging device to the ball passage of the ball delivery device.

9. (Original) The ball given quantity supply apparatus as set forth in Claim 1, further comprising:

a ball passage number count device disposed on the downstream side of the second gate device in the ball passage of the ball delivery device for counting the number of balls having passed through the ball passage.

10. (Original) The ball given quantity supply apparatus as set forth in Claim 9, wherein the ball passage number count device includes an optical sensor, and the pressurized fluid is jetted onto the optical sensor.

11. (Original) The ball given quantity supply apparatus as set forth in Claim 1, further comprising:

a hand-operated ball supply device disposed in the ball passage of the ball delivery device so as to communicate with the downstream side of the second gate device.

12. (Original) The ball given quantity supply apparatus as set forth in Claim 11, wherein the hand-operated ball supply device includes:

a funnel-shaped ball throw member,

a ball guide member extended from the central portion of the bottom surface of the ball throw member to the downstream side of the second gate device in the ball passage of the ball delivery device so as to communicate with the present downstream side, and

a ball mixing device for mixing a plurality of balls thrown into the ball throw member to thereby prevent the plurality of balls from being clogged in the entrance of the ball guide member.

13. (Original) The ball given quantity supply apparatus as set forth in Claim 11, further comprising:

a ball passage number count device disposed downstream of the communicating portion of the hand-operated ball supply device in the ball passage of the ball delivery device for counting the number of balls having passed through the ball passage.

14. (Original) The ball given quantity supply apparatus as set forth in Claim 13, wherein the ball passage number count device includes an optical sensor, and the pressurized fluid is jetted onto the optical sensor.

15-19. (Canceled)